

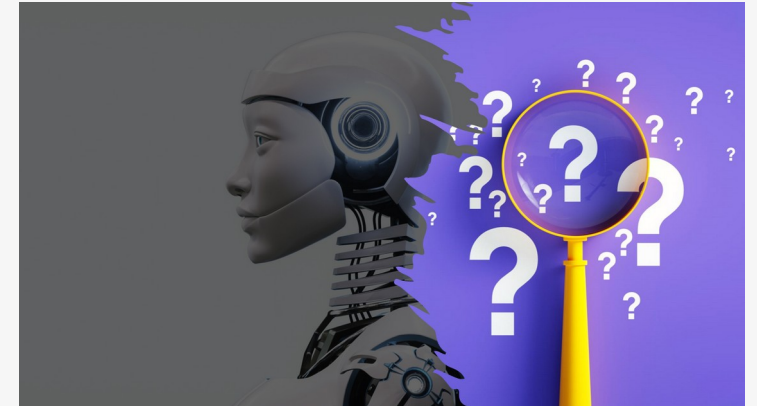
Integrating Generative AI Literacy
into the Information Retrieval
Course at a university in Canada:
towards critical evaluation of online
search results

Lynn Kleinveldt

Lynn.kleinveldt@ufv.ca

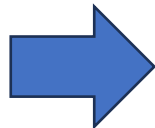
Background

- AI and generative AI - Mixed feelings
- Only 10% of knowledge workers use ChatGPT (Zao-Sanders, 2024)
- Boolean Logic – challenging concept to grasp
- Shift focus to “question development and source evaluation” (Lowe et al., 2018)
- LIS students – part of acquiring expert searching skills
- “Librarians can be biased too, just like AI in information retrieval”




Information Retrieval course

- Purpose - become effective online searchers
- Course Learning Objectives
 - Apply best practices to the reference interview
 - Select databases appropriate for library users' reference questions
 - Select effective search strategies for library users' reference questions
 - Construct effective controlled vocabulary searches
 - Construct effective free text searches
 - Analyze search results for relevant content



ONLINE SEARCHING, WINTER SESSION 2024 - COURSE SCHEDULE

Date	Topics
Week 1 Wed, Jan 3 PART 1	Start-up 
Week 2 Mon Jan 8	Searching before Google History of the Web Libraries & Online Information
WEEK 3 Mon, Jan 15	Accessing quality information through: Web-scale Discovery Systems (WSD) Article Databases UFVL & FVRL Websites
WEEK 4 Mon Jan 22	Reference Interview Information Seeking Behaviour Open- and Closed-ended Questions
WEEK 5 Mon Jan 29	Selecting a Reference Database Selecting a Research Database Classifying Databases
WEEK 6 Mon, Feb 5	Pre-search preparation Boolean operators Facet analysis Logical combinations
WEEK 7 Mon, Feb 12	Controlled Vocabularies & Thesauri
Week 8 Mon Feb 19	Reading week, Feb 18 – 25, — No classes
Family Day — UFV closed	
WEEK 9 Mon, Feb 26	Free-text Searching & Proximity Operators Generative AI and Free-text Searching
WEEK 10 Mon, March 4	Known item Searching

Date	Topics
WEEK 11 Mon, March 11	Search Strategies Improving Results Managing Technological Change
WEEK 12 Mon, March 18	Displaying & Assessing Retrievals Search results retrieved and the role of AI tools
WEEK 13 Mon, March 25	Technical Reading of a Database Search System
Good Friday, March 29	
WEEK 14 Mon April 1	Wrapping up and revision
Easter Monday - No classes, UFV closed	

Learning Outcomes: Free-text searching module (Week 9 of the Course Schedule)

At the end of Week 9, students should be able to:

- Understand the strengths and weaknesses of controlled vocabulary versus free-text searching
- Apply free-text searching techniques
- Combine controlled vocabulary and free-text searching
- Understand how free-text indexing and searching work
- Search Full-text news databases
- Identifying Free-text searching tips
- **Using Generative AI ethically to assist free-text searching**

Next generation free-text searching

“an acquired skill worth practicing to
balance recall and precision” (Markey, 2023)

PubMed database search [Up until February 11, 2020]

COVID-19, no Medical Subject Headings (MeSH) term for months after the pandemic started (Markey, 2023)

The screenshot displays the PubMed search results page. At the top, the NIH National Library of Medicine logo is visible. The search bar contains the query: "2019-nCoV OR 2019nCoV OR COVID-19 OR SARS-CoV-2". Below the search bar, there are buttons for "Advanced", "Create alert", and "Create RSS", along with a "Search" button and a "User Guide" link. The search results are sorted by "Best match" and display options are visible. The results section shows "11,270 results" and "Page 1 of 1,127". A filter bar indicates "Filters applied: from 1000/1/1 - 2020/2/11". The first result is titled "SARS-CoV-2: Structure, Biology, and Structure-Based Therapeutics Development" by Wang MY, Zhao R, Gao LJ, Gao XF, Wang DP, Cao JM. The abstract mentions the pandemic of the novel severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

NIH National Library of Medicine
National Center for Biotechnology Information

PubMed®

2019-nCoV OR 2019nCoV OR COVID-19 OR SARS-CoV-2

Advanced Create alert Create RSS Search User Guide

Save Email Send to Sort by: Best match Display options

MY NCBI FILTERS

RESULTS BY YEAR

1979 2020

TEXT AVAILABILITY

11,270 results Page 1 of 1,127

Filters applied: from 1000/1/1 - 2020/2/11. Clear all

SARS-CoV-2: Structure, Biology, and Structure-Based Therapeutics Development.
1 Wang MY, Zhao R, Gao LJ, Gao XF, Wang DP, Cao JM.
Cite Front Cell Infect Microbiol. 2020 Nov 25;10:587269. doi: 10.3389/fcimb.2020.587269. eCollection 2020.
PMID: 33324574 Free PMC article. Review.
Share The pandemic of the novel **severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)** has been posing great threats to the world in many aspects. ...We further discussed the biology of **SARS-CoV-2** ...

PubMed database search [since 2020 until February 22, 2024: 413 235 results]

NIH National Library of Medicine
National Center for Biotechnology Information

Log in

PubMed®

2019-nCoV OR 2019nCoV OR COVID-19 OR SARS-CoV-2

Advanced Create alert Create RSS Search User Guide

Save Email Send to Sort by: Best match Display options

MY NCBI FILTERS

RESULTS BY YEAR

420,439 results ← SINCE 2020 until April 6, 2024

2020-2024

1 Emerging COVID-19 variants and their impact on SARS-CoV-2 diagnosis, therapeutics and vaccines.

Cite Fernandes Q, Inchakalody VP, Merhi M, Mestiri S, Taib N, Moustafa Abo El-Ella D, Bedhiafi T, Raza A, Al-Zaidan L, Mohsen MO, Yousuf Al-Nesf MA, Hssain AA, Yassine HM, Bachmann MF, Uddin S, Dermime S.

Share Ann Med. 2022 Dec;54(1):524-540. doi: 10.1080/07853890.2022.2031274. PMID: 35132910 Free PMC article. Review.

The emergence of novel and evolving variants of SARS-CoV-2 has fostered the need for change in the form of newer and more adaptive diagnostic methods for the detection of SARS-CoV-2 infections.

What is Generative AI?

“Generative AI refers to deep-learning models that can generate high-quality text, images, and other content based on the data they were trained on” (Martineau, 2023).
OpenAI’s founders’ vision, AI was to be developed in a way that is safe and beneficial to humanity, and open-source software and advanced AI tools were to be publicly shared without intellectual property restrictions (Markoff, 2015).

ChatGPT

Tips for getting started

Ask away

ChatGPT can answer questions, help you learn, write code, brainstorm together, and much more.

Don't share sensitive info

Chat history may be reviewed or used to improve our services. Learn more about your choices in our [Help Center](#).

Check your facts

While we have safeguards, ChatGPT may give you inaccurate information. It's not intended to give advice.

Okay, let's go

ChatGPT now has memory across chats

Keep the conversation going

ChatGPT will carry what it learns between chats, allowing it to provide more relevant responses.

More helpful over time

ChatGPT will become more helpful as you chat, continually remembering details and preferences.

Manage what it remembers

You're in control. Review and delete specific memories, restart from scratch, or turn the feature off in settings.

Continue

Pros and Cons of using Generative AI – ChatGPT 3.5 (free version) (Martineau, 2023)

Pros

- Is a useful tool (like Wikipedia) for starting out with facet analysis
- Develop prompt engineering skills
- Collaborative
- Focus was on building technologies that augment rather than replace humans
- powerful language model – can perform many tasks

Cons

- ChatGPT is more often wrong than right
- Fabricates answers and references / bibliographies
- Trained on information (billions of words) on the open web prior to 2021
- Among other open sources, dataset comes from Common Crawl (crawls the web) and Wikipedia
- Length of answers limited - between 500 and 700 words, "leaving the stories in mid-sentence and not resuming properly when asked to continue"

Write prompts

(Gewirtz, 2024)

You

How does violence in the media affect children?

ChatGPT

Violence in the media can have various effects on children, both in the short term and the long term. Here are some potential impacts:

1. **Desensitization:** Exposure to violent content can desensitize children to real-life violence, making them less sensitive to the pain and suffering of others.
2. **Aggressive Behavior:** Some studies suggest that exposure to violent media can increase aggressive behavior in children, both immediately after exposure and in the long term.
3. **Fear and Anxiety:** Violent media can also cause fear and anxiety in children, especially younger ones who may not understand the difference between fantasy and reality.
4. **Imitation:** Children may imitate the violent behavior they see in the media, especially if they see it being portrayed positively or without consequences.
5. **Desire for More Violence:** Exposure to violent media can lead to a higher tolerance for violence and a greater desire for more violent content.
6. **Impact on Social Skills:** Excessive exposure to violent media can also impact children's social skills, making them more likely to resort to aggression to solve problems.

It's important for parents to monitor and limit their children's exposure to violent media, as well as to discuss the content with them to help them understand the difference between fantasy and reality.

1

You

reference this information

ChatGPT

Certainly! Here are some references that support the information provided:

1. **Desensitization:**

- Anderson, C. A., & Bushman, B. J. (2001). Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: A meta-analytic review of the scientific literature. *Psychological Science*, 12(5), 353-359.

2. **Aggressive Behavior:**

- Bushman, B. J., & Huesmann, L. R. (2006). Short-term and long-term effects of violent media on aggression in children and adults. *Archives of Pediatrics & Adolescent Medicine*, 160(4), 348-352.

3. **Fear and Anxiety:**

- Cantor, J. (2009). *Media and fear in children and adolescents*. Oxford University Press.

4. **Imitation:**

- Bandura, A., Ross, D., & Ross, S. A. (1961). Transmission of aggression through imitation of aggressive models. *Journal of Abnormal and Social Psychology*, 63(3), 575-582.

5. **Desire for More Violence:**

- Funk, J. B., Baldacci, H. B., Pasold, T., & Baumgardner, J. (2004). Violence exposure in real-life, video games, television, movies, and the internet: is there desensitization?. *Journal of Adolescence*, 27(1), 23-39.

6. **Impact on Social Skills:**

- Ostrov, J. M., Gentile, D. A., & Crick, N. R. (2006). Media exposure, aggression and prosocial behavior during early childhood: a longitudinal study. *Social Development*, 15(4), 612-627.

Message ChatGPT...

2

You

and what are the three main concepts addressed in your answer?

ChatGPT

The three main concepts addressed in my answer are:

1. **Effects of Violence in the Media on Children:** This concept explores the various impacts that exposure to violent media can have on children, including desensitization, aggressive behavior, fear and anxiety, and imitation of violent behavior.
2. **Short-Term and Long-Term Impacts:** This concept highlights that the effects of violence in the media on children can be both immediate and long-lasting, potentially influencing their behavior and attitudes over time.
3. **Parental Monitoring and Discussion:** This concept emphasizes the importance of parents monitoring and limiting their children's exposure to violent media, as well as discussing the content with them to help them understand the difference between fantasy and reality.



Message ChatGPT...

3

Verifying sources - ChatGPT

Tip: "think of ChatGPT as a research assistant, it will give you some great starting places. Use the names of the articles (which may be completely fake or just not accessible) and drop them into Google" (Gewirtz, 2023)..

References

Anderson, C. A., & Bushman, B. J. (2001). Effects of violent video games on aggressive behavior, aggressive cognition, aggressive affect, physiological arousal, and prosocial behavior: A meta-analytic review of the scientific literature. *Psychological Science*, 12(5), 353-359.

Bandura, A., Ross, D., & Ross, S. A. (1961). Transmission of aggression through imitation of aggressive models. *Journal of Abnormal and Social Psychology*, 63(3), 575-582.

Cantor, J. (2009). *Media and fear in children and adolescents*. Oxford University Press.



198 CHILDREN, ADOLESCENTS, AND THE MEDIA

Cantor, J. (2003). **Media and fear in children and adolescents**. In D. A. Gentile (Ed.), *Media violence and children: A complete guide for parents and professionals* (pp. 185-203). Westport, CT: Praeger.

Cantor, J., & Nathanson, A. I. (1996). Children's fright reactions to television news. *Journal*



You
Provide an analysis on how does violence in the media affect children and include in-text references and reference list

ChatGPT
Analysis of the Effects of Violence in the Media on Children

Exposure to violence in the media has been a topic of concern due to its potential impact on children's behavior and mental health. Several studies have investigated the effects of violent media content on children, highlighting various negative consequences.

Desensitization and Aggressive Behavior

One of the key findings is that exposure to violent media can desensitize children to real-life violence (Anderson & Bushman, 2001). This desensitization may lead to an increased tolerance for violent behavior and a diminished sensitivity to the pain and suffering of others. Furthermore, repeated exposure to violent media has been linked to an increase in aggressive behavior in children (Anderson & Bushman, 2001). This effect can manifest both immediately after exposure and over the long term, potentially influencing how children interact with others and resolve conflicts.

Fear and Anxiety

Google "Media and fear in children and adolescents"

< All Images Books Videos News More Tools

Any view Any document Any time

books.google.ca > books
Children, Adolescents, and the Media
Victor C. Strasburger, Barbara J. Wilson, Amy B. Jordan · 2009

FOUND INSIDE

... **Media and fear in children and adolescents**. In D. A. Gentile (Ed.), *Media violence and children: A complete guide for parents and professionals* (pp. 185-203). Westport, CT: Praeger. Cantor, J., & Nathanson, A. I. (1996). Children's ...

Preview More editions

Verifying answers by ChatGPT

You
based on your answer, what are the 4 main theories you have drawn from?

ChatGPT

The analysis draws from four main theories to explain the effects of violence in the media on children:

1. **Desensitization Theory**: This theory suggests that repeated exposure to violent media can desensitize individuals to real-life violence, reducing their emotional response and sensitivity to violent acts (Anderson & Bushman, 2001).

2. **Social Learning Theory**: According to Bandura's social learning theory, individuals learn new behaviors by observing others. In the context of media, children may imitate aggressive behaviors they see in the media, especially if those behaviors are portrayed positively or without consequences (Bandura, Ross, & Ross, 1961).

3. **Cognitive Priming Theory**: This theory posits that exposure to violent media can prime aggressive thoughts and feelings, making aggressive behavior more likely in the short term (Anderson & Bushman, 2001).

4. **Fear and Anxiety Theory**: Cantor's work on media and fear suggests that exposure to violent media can evoke fear and anxiety in children, particularly when they are unable to distinguish between fantasy and reality (Cantor, 2009).

These theories provide a framework for understanding how violence in the media can affect children's behavior,



Library Menu: University of the Fraser Valley Library

GALE GENERAL ONEFILE

"Desensitization Theory"

SHOWING RESULTS FOR

Academic Journals (4) **News (2)**

4 ACADEMIC JOURNALS Sort by: Relevance

Search Terms: Basic Search: "Desensitization Theory"

Applied Filters:

Violent Video Gaming and Aggression in Children.

Authors: Shainy B. Varghese and Carolyn A. Phillips
From: *Pediatric Nursing* (Vol. 48, Issue 4) Peer-Reviewed
July-August 2022 2,881 words Report



Theoretical Explanations

Social learning theory, operant conditioning, and **desensitization theory** explain the process of learning violence through repeatedly playing violent video games. Social learning theory (Bandura, 1977) claims aggression, like other social attitudes, values, and behaviors, is learned from social interactions and maintained by other conditions, such as family situation and continuous exposure to violence. Observation has a significant role in learning social behaviors, so children observe and imitate what they see early in life. Children encode behaviors of their role models they observe and imitate them. Thus, social learning theory framework attributes media violence--acts of aggression by other people or characters/actors in TV shows, movies, or video games--to the leading cause of aggression in children when compared to children with less exposure.

Operant conditioning is a learning theory that posits behavior changes as the result of reinforcement occurring in response to an action (McLeod, 2018b). Operant conditioning theory, first described by the behaviorist B.F. Skinner, focuses on the consequences of actions and how those consequences affect behavior. This theory was heavily influenced by the psychologist Edward Thorndike, who proposed law of effect--actions are followed by a desirable effect and will be repeated (McLeod, 2018a). According to operant conditioning theory and principles of law of effect, every action that has a reward will be repeated. Gaming systems include some sort of reward in response to the performance of the player. Violent video games may rate the performance of the player by weapons used and the number of kills or defeats. Consequently, the player associates aggressive acts with a reward, which encourages further aggression. Children who play violent video games excessively may learn to respond the same way they respond in video games, and those responses may become part of their usual behavioral repertoire.

Lastly, **desensitization theory** explains repeated exposure to violence leads to committing or reacting

Week 9 Learning Activity

Instructions: Provide FT database queries for each of the following topics. Complete a facet analysis first and do some brainstorming. Be sure to include any necessary **synonyms** and to use the various types of **operators** you learned about in Week 9 (i.e., adjacency, truncation, proximity, and wildcards). Follow the example provided below.

This activity is not for marks and do not need to be submitted. However, it is important to complete it as it will assist in acquiring the skill of free text searching and will prepare you for the final assignment.

Example:

Topic:

Retrieve articles about current HIV infection rates among young men who live on reserves in Canada

Facet Analysis:

Facet A: HIV infection rates (**compound facet**)

Facet B: Young men (**compound facet**)

Facet C: Reserves or Reservations (Implicit in this facet is the idea of First Nations or Indigenous) (**single facet**)

Facet D: Canada (**single facet**)

Current (like a 'relationship facet'; requires date limiter)

Brainstorming:

HIV infection rates
Human immunodeficiency virus
Infection

Young men
Youths
Male

First Nations
Aboriginal
Native
Indigenous
Indian (outdated but could show up)

Reserves

Reservations

Database Query/Boolean Search String:

(HIV OR "human immunodeficiency virus" OR "HIV infection rates") AND ("young men" OR you* n5 men) AND (Indian OR "first nations" OR aborigin* OR native OR indigenous) AND reserv* AND canad*

A **date limiter** should be used in this search to filter results to the last five years or so.

Question 1

Topic: Retrieve articles about the impact of fake news on information literacy programs in **academic** libraries.

Question 2

Topic: Retrieve articles about the destruction of different types of cultural institutions in Europe during the Second World War.

Question 3

Topic: Retrieve Newspaper Articles on the issue of plagiarism among students at higher education institutions globally prior to the COVID-19 pandemic.

OPTIONAL

Write effective ChatGPT prompts (refer to example prompts in the slides to get some insight) for all three questions above. Evaluate ChatGPT's answers.

Did the answers provide key concepts related to your facet analysis conducted in questions 1-3?

Are the references provided by ChatGPT valid sources?

Learning Activity submissions (optional)

Discussion Board

Discussions are a good way to encourage students to think critically about your coursework and interact with each others' ideas. You can create discussions around individual course lessons or for your course in general. [More Help](#)

Create Forum

Search

<input type="checkbox"/>	FORUM	DESCRIPTION	TOTAL POSTS	UNREAD POSTS	UNREAD REPLIES TO ME	TOTAL PARTICIPANTS
<input type="checkbox"/>	Reflections on writing ChatGPT prompts versus free-text searching in databases	<p>This is optional, but could be considered to boost your participation mark by 5 Marks.</p> <p>It is based on Week 9 Learning Activity - optional section.</p> <p>Post a short reflection (no more than a paragraph) on your experience writing ChatGPT prompts on the 3 questions and the answers retrieved. How relevant were the answers compared to your own answers to the 3 questions?</p>	8	0	0	8

8 (25%) out of 32 students submitted

Student reflections on ChatGPT learning

experience

"gave a vague idea of what you would get, but still needed further investigation".

"review the initial query, ask more clarifying questions"

"not able to retrieve any results for the first question"

"I preferred using free text searching in the library system over ChatGPT"

"This is my first-time using ChatGPT"
[5 out of 8]

"It would be helpful, to review the sources provided by ChatGPT"

"it was fun to shoot questions and see how the AI answered"

"don't think I will use this much beyond getting initial ideas for topic searches but its good to know its here and it will be interesting to watch how this technology develops in the coming years".



"in terms of actual article retrievals, I think I will stick to mastering that skill myself"

"In my prompt for references to question 1, it would merge titles of articles or books together making sources hard to track down".

"I too think it would make a great research assistant"

"the titles or authors may be incorrect"

"opened my eyes to the possibilities of reference search support"

"a useful tool to use as a starting off point"

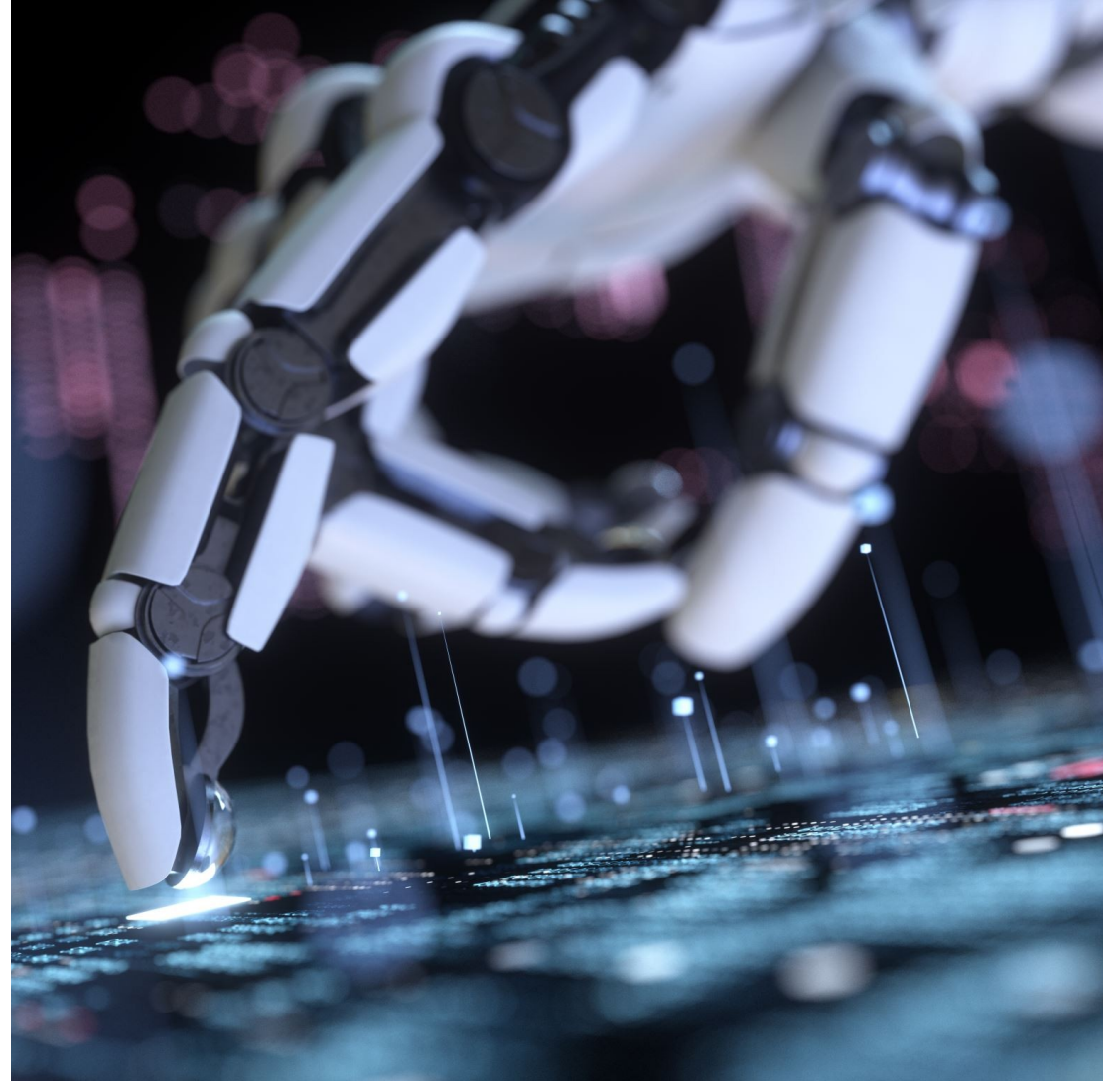
"I see how ChatGPT could be a helpful resource, but I don't think it is as reliable as some may think it is".

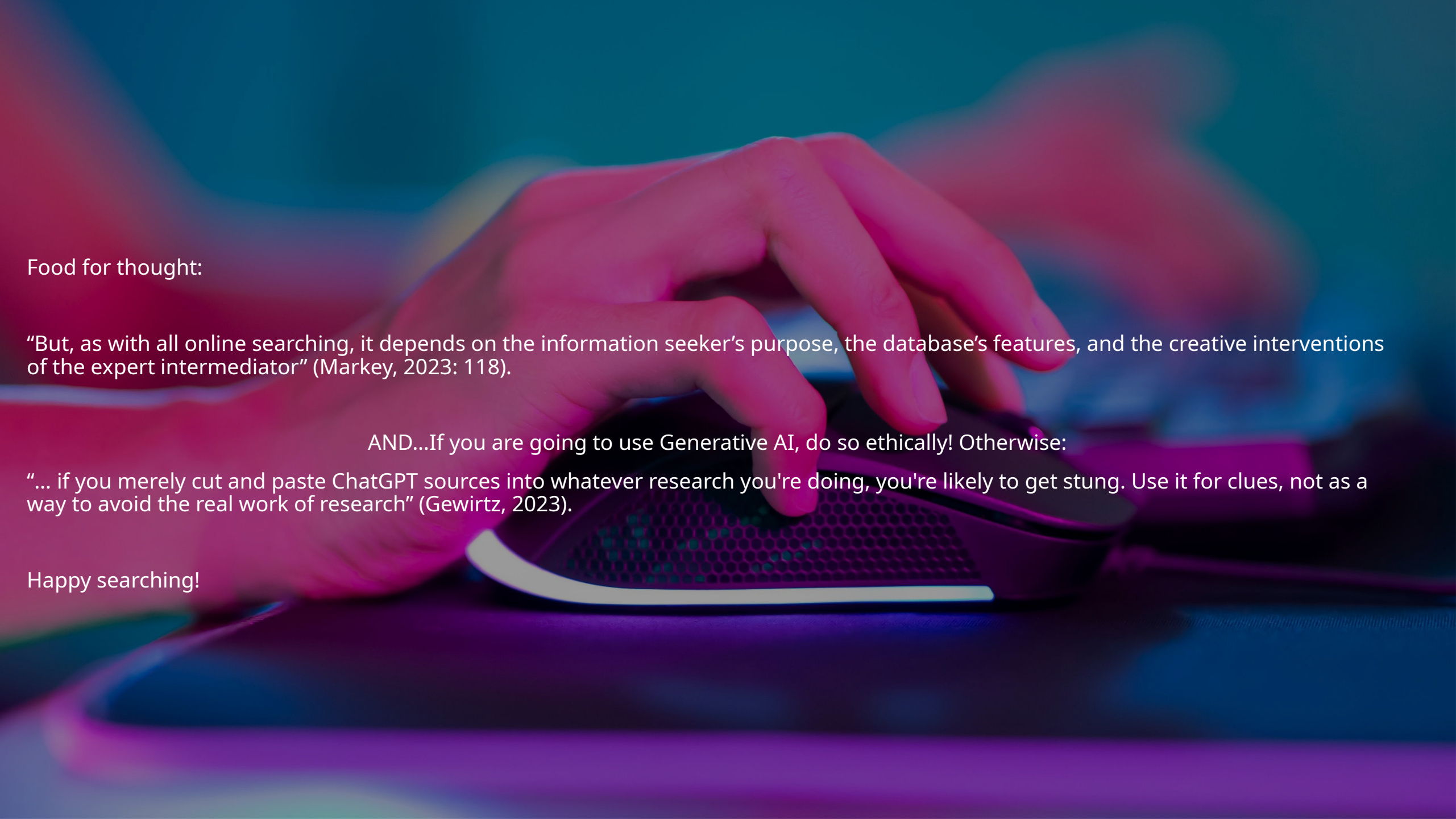
"a very interesting experiment"

"an understanding of where its limits lie is necessary to effectively use it"

My reflections and the way forward

- Interesting times in higher education
- Current awareness remains key
- Next generation online searchers – require effective information retrieval skills
- Continue using AI tools and generative AI in the course – an acquired skill



A close-up photograph of a hand clicking a computer mouse. The scene is lit with a cool, blue and purple ambient light, creating a futuristic or tech-oriented atmosphere. The mouse is black with a silver scroll wheel and buttons. The hand is positioned over the mouse, with the index finger clicking one of the buttons. The background is blurred, showing what appears to be a desk or computer setup.

Food for thought:

“But, as with all online searching, it depends on the information seeker’s purpose, the database’s features, and the creative interventions of the expert intermediary” (Markey, 2023: 118).

AND...If you are going to use Generative AI, do so ethically! Otherwise:

“... if you merely cut and paste ChatGPT sources into whatever research you're doing, you're likely to get stung. Use it for clues, not as a way to avoid the real work of research” (Gewirtz, 2023).

Happy searching!

References

- Gewirtz, D. 2023. How to make ChatGPT provide sources and citations. [Nov, 29, 2023]. *ZDNET*. <https://www.zdnet.com/article/how-to-make-chatgpt-provide-sources-and-citations/> [22 February 2024].
- Gewirtz, D. 2024. How to write better ChatGPT prompts in 5 steps. [Jan, 24, 2024]. *ZDNET*. <https://www.zdnet.com/article/how-to-write-better-chatgpt-prompts-in-5-steps/>[22 February 2024].
- Lowe, M., Maxson, B., Stone, S., Miller, W., Snajdr, E., & Hanna, K. (2018). The Boolean is Dead, Long Live the Boolean! Natural Language versus Boolean Searching in Introductory Undergraduate Instruction. *College & Research Libraries*, 79(4), 517. doi:<https://doi.org/10.5860/crl.79.4.517>
- Markey, K. (2023). Free-Text Searching. Chapter 7. In: *Online searching: A guide to finding quality information efficiently and effectively*. (3rd ed.). Lanham, MD: Rowman & Littlefield.
- Markoff, J. 2015. Silicon valley investors to bankroll artificial-intelligence center. [Dec, 13, 2015]. *The Seattle Times*, <https://www.seattletimes.com/business/technology/silicon-valley-investors-to-bankroll-artificial-intelligence-center/> [22 February 2024].
- Martineau, K. 2023. What is generative AI? [Apr, 20, 2023]. IBM. <https://research.ibm.com/blog/what-is-generative-AI> [22 February 2024].
- Zao-Sanders, M. 2024. How People Are Really Using GenAI. Technology and Analytics. [March 19, 2024]. *Harvard Business Review*. https://hbr.org/2024/03/how-people-are-really-using-genai?utm_source=bensbites&utm_medium=newsletter&utm_campaign=daily-digest-ai-businesses-for-solo-devs [25 March 2024].